



Draft Genome Sequence of Rice Endophyte-Associated Isolate Kosakonia oryzae KO348

Xianfa Meng, a,b Iris Bertani, a Pamela Abbruscato, c Pietro Piffanelli, c Danilo Licastro, d Changhai Wang, b Vittorio Venturia

Bacteriology Group, International Centre for Genetic Engineering and Biotechnology (ICGEB), Trieste, Italy^a; Jiangsu Provincial Key Laboratory of Marine Biology, College of Resources and Environmental Sciences, Nanjing Agricultural University, Nanjing, China^b; Rice Genomics Unit, Parco Tecnologico Padano, Localita Cascina Codazza, Lodi, Italy^c; Cluster in Biomedicine (CBM) SCRL–Genomics, Area Science Park, Basovizza, Trieste, Italy^d

Kosakonia oryzae KO348 is an endophytic and plant growth-promoting strain isolated from the roots of rice in Italy. Here, we report the draft genome sequence of Kosakonia oryzae KO348.

Received 1 May 2015 Accepted 4 May 2015 Published 4 June 2015

Citation Meng X, Bertani I, Abbruscato P, Piffanelli P, Licastro D, Wang C, Venturi V. 2015. Draft genome sequence of rice endophyte-associated isolate Kosakonia oryzae KO348. Genome Announc 3(3):e00594-15. doi:10.1128/genomeA.00594-15.

Copyright © 2015 Meng et al. This is an open-access article distributed under the terms of the Creative Commons Attribution 3.0 Unported license. Address correspondence to Vittorio Venturi, venturi@icqeb.orq.

reated in 1960, the genus *Enterobacter* is one of the largest genera within the family *Enterobacteriaceae* (1). Recently, taxonomic studies have resulted in rearrangement of the *Enterobacter* genera (2). As a result, a new genus designated *Kosakonia*, which includes the species *Kosakonia cowanii*, *Kosakonia radicincitans*, *Kosakonia oryzae*, and *Kosakonia arachidis* (2), was proposed, and in 2014, the nitrogenfixing bacterium *Enterobacter sacchari* was reclassified as *Kosakonia sacchari* (3). *Kosakonia oryzae* has been associated with rice and has been shown to possess plant growth-promoting properties, including the ability to fix atmospheric nitrogen (4).

Kosakonia oryzae KO348 was isolated from surface-sterilized roots of the Italian rice cultivar Vialone Nano. Phylogenetic analyses using 16s rRNA and multilocus sequence analysis based on gyrB, rpoB, infB, and atpD indicate that this novel isolate belongs to genus Kosakoni, and here we announce its draft genome sequence. Genomic DNA of K. oryzae KO348 was purified following the protocol of the Nextera XT DNA library preparation kit (Illumina) and then used to prepare a sequencing-ready library. Sequencing was performed on Illumina MiSeq platform using 150-bp paired-end reads. Total number of pairs of reads was 5,010,628, representing approximately 10-fold coverage of the genome. We performed the *de novo* assembly using SPAdes v3.0 (5), generating 68 contigs with a maximum length of 462 kbp. The total length of the contig assembly was 5.0 Mbp, and the N_{50} length was 172 kbp, assuming a genome size of 5.0 Mbp. The G+C content was 53.9%, similar to that of other Kosakonia sequenced genomes. Automated annotation of the K. oryzae KO348 draft genome sequence was performed using RAST (6) assigning a total of 4,763 candidate protein-coding genes with 1,045 (21.94%) annotated as hypothetical proteins. A total of 86 RNA coding sequences were also identified. The K. oryzae KO348 genome presents several genes related to plant colonization and plant growth promotion, including genes for exopolysaccharide production, flagellar motility, siderophore production, auxin biosynthesis, and the nif gene cluster. Furthermore, it contains genes involved in the biosynthesis of type II, IV, V, VI, VII, and VIII secretion systems.

Nucleotide sequence accession numbers. This whole-genome shotgun project has been deposited at DDBJ/EMBL/GenBank under the accession no. JZLI00000000. The version described in this paper is version JZLI01000000.

ACKNOWLEDGMENTS

This work was supported by Progetto AGER, grant 2010-2369. The Ph.D. program of Xianfa Meng was funded by a grant from CSC (China).

REFERENCES

- 1. Hormaeche E, Edwards PR. 1960. A proposed genus *Enterobacter*. Int J Syst Evol Microbiol 10:71–74. http://dx.doi.org/10.1099/0096266X-10-2-71.
- 2. Brady C, Cleenwerck I, Venter S, Coutinho T, De Vos P. 2013. Taxonomic evaluation of the genus Enterobacter based on multilocus sequence analysis (MLSA): proposal to reclassify E. nimipressuralis and E. Amnigenus into Lelliottia gen. nov. as Lelliottia nimipressuralis comb. nov. and Lelliottia amnigena comb. nov., respectively, E. Gergoviae and E. Pyrinus into Pluralibacter gen. nov. as Pluralibacter gergoviae comb. nov. and Pluralibacter pyrinus comb. nov., respectively, E. cowanii, E. radicincitans, E. Oryzae and E. arachidis into Kosakonia gen. nov. as Kosakonia cowanii comb. nov., Kosakonia radicincitans comb. nov., Kosakonia oryzae comb. nov. and Kosakonia arachidis comb. nov., respectively, and E. turicensis, E. helveticus and E. pulveris into Cronobacter as Cronobacter zurichensis nom. nov., Cronobacter helveticus comb. nov. and Cronobacter pulveris comb. nov., respectively, and emended description of the genera Enterobacter and Cronobacter. Syst Appl Microbiol 36:309–319. http://dx.doi.org/10.1016/j.syapm.2013.03.005.
- 3. Chen M, Zhu B, Lin L, Yang L, Li Y, An Q. 2014. Complete genome sequence of *Kosakonia sacchari* type strain SP1T. Stand Genomic Sci 9:1311–1318. http://dx.doi.org/10.4056/sigs.5779977.
- 4. Peng G, Zhang W, Luo H, Xie H, Lai W, Tan Z. 2009. Enterobacter oryzae sp. nov., a nitrogen-fixing bacterium isolated from the wild rice species *Oryza latifolia*. Int J Syst Evol Microbiol **59**:1650–1655.
- Bankevich A, Nurk S, Antipov D, Gurevich AA, Dvorkin M, Kulikov AS, Lesin VM, Nikolenko SI, Pham S, Prjibelski AD, Pyshkin AV, Sirotkin AV, Vyahhi N, Tesler G, Alekseyev MA, Pevzner PA. 2012. SPAdes: a new genome assembly algorithm and its applications to single-cell sequencing. J Comput Biol 19:455–477. http://dx.doi.org/10.1089/cmb.2012.0021.
- Aziz RK, Bartels D, Best AA, DeJongh M, Disz T, Edwards RA, Formsma K, Gerdes S, Glass EM, Kubal M, Meyer F, Olsen GJ, Olson R, Osterman AL, Overbeek RA, McNeil LK, Paarmann D, Paczian T, Parrello B, Pusch GD. 2008. The RAST server: Rapid Annotations using Subsystems Technology. BMC Genomics 9:75. http://dx.doi.org/10.1186/1471-2164-9-75.